What is claimed is:

1. A method of forming a solder ball contact, comprising:
forming a metal contact pad on a substrate;
forming an insulating layer on the metal contact pad;
removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;
depositing solder on the exposed portion of the metal contact pad using selective deposition, thereby forming a solder contact; and
annealing the solder contact to form a solder ball contact.

2. The method of claim 1, wherein depositing solder on the exposed portion of the metal contact pad using selective deposition further comprises depositing solder on the exposed portion of the metal contact pad using a deposition process selected from the group consisting of immersion contact, chemical vapor deposition and electrolytic deposition.

3. The method of claim 1, wherein depositing solder further comprises depositing at least one material selected from the group consisting of lead, tin and bismuth.

4. The method of claim 1, wherein forming a metal contact pad further comprises:
forming a layer of zirconium on the substrate;
forming a layer of nickel on the layer of zirconium;
forming a layer of copper on the layer of nickel;
forming a layer of gold on the layer of copper; and
forming a layer of lead on the layer of gold.

5. The method of claim 1, wherein forming a metal contact pad further comprises:

forming a layer of zirconium on the substrate, wherein the layer of zirconium is approximately 500 Angstroms thick;

forming a layer of nickel on the layer of zirconium, wherein the layer of nickel is approximately 750 Angstroms thick;

forming a layer of copper on the layer of nickel, wherein the layer of copper is approximately 5000 Angstroms thick;

forming a layer of gold on the layer of copper, wherein the layer of gold is approximately 750 Angstroms thick; and

forming a layer of lead on the layer of gold, wherein the layer of lead is approximately 500 Angstroms thick.

6. The method of claim 1, wherein annealing the solder contact to form a solder ball contact comprises a solder ball contact approximating a spherical shape.

7. The method of claim 1, wherein annealing the solder contact to form a solder ball contact comprises a solder ball contact having a spherical portion and a flat contact portion.

8. The method of claim 1, wherein removing a portion of the insulating layer further comprises forming an exposed portion of the metal contact pad having a diameter of approximately 2 microns.

9. A method of forming a solder ball contact, comprising:

forming a metal contact pad on a substrate;

forming an insulating layer on the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;

immersing the substrate in molten solder;

depositing solder on the exposed portion of the metal contact pad, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

10. The method of claim 9, wherein immersing the substrate in molten solder comprises immersing the substrate in molten solder having at least one material selected from the group consisting of lead, tin and bismuth.

11. A method of forming a solder ball contact, comprising:

forming a metal contact pad on a substrate;

forming an insulating layer on the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad, wherein the exposed portion of the metal contact pad has a diameter of approximately 2 microns;

immersing the substrate in molten lead;

depositing lead on the exposed portion of the metal contact pad, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

12. A method of forming a solder ball contact, comprising:

forming a metal contact pad on a substrate;

forming an insulating layer on the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;

adsorbing reactants on the exposed portion of the metal contact pad;

reacting the reactants on the exposed portion of the metal contact pad, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

13. A method of forming a solder ball contact, comprising:

forming a metal contact pad on a substrate;

forming an insulating layer on the metal contact pad;

forming a resist layer on the insulating layer;

patterning the resist layer to define a future exposed portion of the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming the exposed portion of the metal contact pad;

electrolytically depositing solder on the exposed portion of the metal contact pad, thereby forming a solder contact;

removing the resist layer, thereby exposing the solder contact above a surface of the insulating layer; and

annealing the solder contact to form a solder ball contact.

14. The method of claim 13, wherein electrolytically depositing solder on the exposed portion of the metal contact pad comprises electrolytically depositing at least one material selected from the group consisting of lead, tin and bismuth.

15. A method of forming a solder ball contact, comprising:

forming a metal contact pad on a substrate;

forming an insulating layer on the metal contact pad, wherein the insulating layer has a thickness of approximately 1.5 microns;

forming a resist layer on the insulating layer;

patterning the resist layer to define a future exposed portion of the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming the exposed portion of the metal contact pad,

wherein the exposed portion of the metal contact pad has a diameter of approximately 2 microns;

electrolytically depositing lead on the exposed portion of the metal contact pad, thereby forming a solder contact, wherein the solder contact has a thickness of approximately 2.33 microns;

removing the resist layer, thereby exposing the solder contact above a surface of the insulating layer; and

annealing the solder contact to form a solder ball contact.

16. A method of forming a solder ball contact, comprising:

forming a metal contact pad on a substrate;

forming an insulating layer on the metal contact pad;

forming a resist layer on the insulating layer;

patterning the resist layer to define a future exposed portion of the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming the exposed portion of the metal contact pad;

electrolytically depositing a first metal layer on the exposed portion of the metal contact pad;

electrolytically depositing a second metal layer on the first metal layer, wherein the first metal layer and the second metal layer form a solder contact;

removing the resist layer, thereby exposing the solder contact above a surface of the insulating layer; and

annealing the solder contact to form a solder ball contact.

17. The method of claim 16, wherein electrolytically depositing a first metal layer comprises electrolytically depositing a first metal layer containing at least one material selected from the group consisting of lead, tin and bismuth.

18. The method of claim 16, wherein electrolytically depositing a second metal layer comprises electrolytically depositing a second metal layer containing at least one material selected from the group consisting of lead, tin and bismuth.

19. The method of claim 16, wherein electrolytically depositing a first metal layer comprises electrolytically depositing a layer of lead and wherein electrolytically depositing a second metal layer comprises electrolytically depositing a layer of tin.

20. The method of claim 19, wherein electrolytically depositing a layer of lead comprises electrolytically depositing a layer of lead to a thickness of approximately 0.91 microns and wherein electrolytically depositing a layer of tin comprises electrolytically depositing a layer of tin to a thickness of approximately 1.42 microns.

21. The method of claim 16, wherein annealing the solder contact to form a solder ball contact comprises a solder ball contact approximating a spherical shape.

22. The method of claim 16, wherein annealing the solder contact to form a solder ball contact comprises a solder ball contact having a spherical portion and a flat contact portion.

23. A method of forming a solder ball contact, comprising:
forming a metal contact pad on a substrate;
forming an insulating layer on the metal contact pad, wherein the insulating layer has a thickness of approximately 1.5 microns;
forming a resist layer on the insulating layer;
patterning the resist layer to define a future exposed portion of the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming the exposed portion of the metal contact pad, wherein the exposed portion of the metal contact pad has a diameter of approximately 2 microns;

electrolytically depositing a layer of lead on the exposed portion of the metal contact pad, wherein the layer of lead has a thickness of approximately 0.91 microns;

electrolytically depositing a layer of tin on the layer of lead, wherein the layer of tin has a thickness of approximately 1.42 microns, further wherein the layer of lead and the layer of tin form a solder contact having a thickness of approximately 2.33 microns;

removing the resist layer, thereby exposing the solder contact above a surface of the insulating layer; and

annealing the solder contact to form a solder ball contact.

24. A semiconductor die, comprising:

an integrated circuit supported by a substrate;

a metal pattern line coupled to the integrated circuit;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;

depositing solder on the exposed portion of the metal contact pad using selective deposition, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

25. The semiconductor die of claim 24, wherein the solder ball contact is formed by a method, the method further comprising depositing solder on the exposed portion of the metal contact pad using a deposition process selected from the group consisting of immersion contact, chemical vapor deposition and electrolytic deposition.

26. The semiconductor die of claim 24, wherein the solder comprises at least one material selected from the group consisting of lead, tin and bismuth.

27. A semiconductor die, comprising:
an integrated circuit supported by a substrate;
a metal pattern line coupled to the integrated circuit;
a metal contact pad coupled to the metal pattern line; and
a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:
forming an insulating layer on the metal contact pad;
removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;
immersing the substrate in molten solder;
depositing solder on the exposed portion of the metal contact pad, thereby forming a solder contact; and
annealing the solder contact to form a solder ball contact.

28. The semiconductor die of claim 27, wherein the molten solder comprises at least one material selected from the group consisting of lead, tin and bismuth.

29. A semiconductor die, comprising:
an integrated circuit supported by a substrate;

a metal pattern line coupled to the integrated circuit;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;

adsorbing reactants on the exposed portion of the metal contact pad;

reacting the reactants on the exposed portion of the metal contact pad, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

30. A semiconductor die, comprising:

an integrated circuit supported by a substrate;

a metal pattern line coupled to the integrated circuit;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

forming a resist layer on the insulating layer;

patterning the resist layer to define a future exposed portion of the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming the exposed portion of the metal contact pad;

electrolytically depositing solder on the exposed portion of the metal contact pad, thereby forming a solder contact;

removing the resist layer, thereby exposing the solder contact above a surface of the insulating layer; and

annealing the solder contact to form a solder ball contact.

31. The semiconductor die of claim 30, wherein the solder comprises at least one material selected from the group consisting of lead, tin and bismuth.

32. A memory device, comprising:

an array of memory cells;

a metal pattern line coupled to the array of memory cells;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;

depositing solder on the exposed portion of the metal contact pad using selective deposition, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

33. The memory device of claim 32, wherein the solder ball contact is formed by a method, the method further comprising depositing solder on the exposed portion of the metal contact pad using a deposition process selected from the group consisting of immersion contact, chemical vapor deposition and electrolytic deposition.

34. The memory device of claim 32, wherein the solder comprises at least one material selected from the group consisting of lead, tin and bismuth.

35. A memory device, comprising:
an array of memory cells;
a metal pattern line coupled to the array of memory cells;
a metal contact pad coupled to the metal pattern line; and
a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:
forming an insulating layer on the metal contact pad;
removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;
immersing the substrate in molten solder;
depositing solder on the exposed portion of the metal contact pad, thereby forming a solder contact; and
annealing the solder contact to form a solder ball contact.

36. The memory device of claim 35, wherein the molten solder comrpises at least one material selected from the group consisting of lead, tin and bismuth.

37. A memory device, comprising:
an array of memory cells;
a metal pattern line coupled to the array of memory cells;
a metal contact pad coupled to the metal pattern line; and
a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:
forming an insulating layer on the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;

adsorbing reactants on the exposed portion of the metal contact pad;

reacting the reactants on the exposed portion of the metal contact pad, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

38. A memory device, comprising:

an array of memory cells;

a metal pattern line coupled to the array of memory cells;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

forming a resist layer on the insulating layer;

patterning the resist layer to define a future exposed portion of the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming the exposed portion of the metal contact pad;

electrolytically depositing solder on the exposed portion of the metal contact pad, thereby forming a solder contact;

removing the resist layer, thereby exposing the solder contact above a surface of the insulating layer; and

annealing the solder contact to form a solder ball contact.

39. The memory device of claim 38, wherein the solder comprises at least one material selected from the group consisting of lead, tin and bismuth.

40. A memory module, comprising:

a support;

a plurality of leads extending from the support;

a command link coupled to at least one of the plurality of leads;

a plurality of data links, wherein each data link is coupled to at least one of the plurality of leads; and

at least one memory device contained on the support and coupled to the command link, wherein the at least one memory device comprises:

an array of memory cells;

a metal pattern line coupled to the array of memory cells;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;

depositing solder on the exposed portion of the metal contact pad using selective deposition, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

41. The memory module of claim 40, wherein the solder ball contact is formed by a method, the method further comprising depositing solder on the exposed portion of the metal contact pad using a deposition process selected from the group consisting of immersion contact, chemical vapor deposition and electrolytic deposition.

42. The memory module of claim 40, wherein the solder comprises at least one material selected from the group consisting of lead, tin and bismuth.

43. A memory module, comprising:
a support;
a plurality of leads extending from the support;
a command link coupled to at least one of the plurality of leads;
a plurality of data links, wherein each data link is coupled to at least one of the plurality of leads; and
at least one memory device contained on the support and coupled to the command link, wherein the at least one memory device comprises:
an array of memory cells;
a metal pattern line coupled to the array of memory cells;
a metal contact pad coupled to the metal pattern line; and
a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:
forming an insulating layer on the metal contact pad;
removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;
immersing the substrate in molten solder;

depositing solder on the exposed portion of the metal contact pad, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

44. The memory module of claim 43, wherein the molten solder comprises at least one material selected from the group consisting of lead, tin and bismuth.

45. A memory module, comprising:

a support;

a plurality of leads extending from the support;

a command link coupled to at least one of the plurality of leads;

a plurality of data links, wherein each data link is coupled to at least one of the plurality of leads; and

at least one memory device contained on the support and coupled to the command link, wherein the at least one memory device comprises:

an array of memory cells;

a metal pattern line coupled to the array of memory cells;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;

adsorbing reactants on the exposed portion of the metal contact pad;

reacting the reactants on the exposed portion of the metal contact pad, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

46. A memory module, comprising:

a support;

a plurality of leads extending from the support;

a command link coupled to at least one of the plurality of leads;

a plurality of data links, wherein each data link is coupled to at least one of the plurality of leads; and

at least one memory device contained on the support and coupled to the command link, wherein the at least one memory device comprises:

an array of memory cells;

a metal pattern line coupled to the array of memory cells;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

forming a resist layer on the insulating layer;

patterning the resist layer to define a future exposed portion of the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby

forming the exposed portion of the metal contact pad;

electrolytically depositing solder on the exposed portion of the metal contact pad, thereby forming a solder contact;

removing the resist layer, thereby exposing the solder contact above a surface of the insulating layer; and

annealing the solder contact to form a solder ball contact.

47. The memory module of claim 46, wherein the solder comprises at least one material selected from the group consisting of lead, tin and bismuth.

48. A memory system, comprising:

a controller;

a command link coupled to the controller;

a data link coupled to the controller; and

a memory device coupled to the command link and the data link, wherein the memory device comprises:

an array of memory cells;

a metal pattern line coupled to the array of memory cells;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby

forming an exposed portion of the metal contact pad;

depositing solder on the exposed portion of the metal contact pad using selective deposition, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

49. The memory system of 48, wherein the solder ball contact is formed by a method, the method further comprising depositing solder on the exposed portion of the metal contact pad using a deposition process selected from the group consisting of immersion contact, chemical vapor deposition and electrolytic deposition.

50. The memory system of 48, wherein the solder comprises at least one material selected from the group consisting of lead, tin and bismuth.

51. A memory system, comprising:

a controller;

a command link coupled to the controller;

a data link coupled to the controller; and

a memory device coupled to the command link and the data link, wherein the memory device comprises:

an array of memory cells;

a metal pattern line coupled to the array of memory cells;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;

immersing the substrate in molten solder;

depositing solder on the exposed portion of the metal contact pad, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

52. The memory system of claim 51, wherein the molten solder comprises at least one material selected from the group consisting of lead, tin and bismuth.

53. A memory system, comprising:

a controller;

a command link coupled to the controller;

a data link coupled to the controller; and

a memory device coupled to the command link and the data link, wherein the memory device comprises:

an array of memory cells;

a metal pattern line coupled to the array of memory cells;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby

forming an exposed portion of the metal contact pad;

adsorbing reactants on the exposed portion of the metal contact pad;

reacting the reactants on the exposed portion of the metal contact pad, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

54. A memory system, comprising:

a controller;

a command link coupled to the controller;

a data link coupled to the controller; and

a memory device coupled to the command link and the data link, wherein the memory device comprises:

an array of memory cells;

a metal pattern line coupled to the array of memory cells;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

forming a resist layer on the insulating layer;

patterning the resist layer to define a future exposed portion of the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby

forming the exposed portion of the metal contact pad;

electrolytically depositing solder on the exposed portion of the metal contact pad, thereby forming a solder contact;

removing the resist layer, thereby exposing the solder contact above a surface of the insulating layer; and

annealing the solder contact to form a solder ball contact.

55. The memory system of claim 54, wherein the solder comprises at least one material selected from the group consisting of lead, tin and bismuth.

56. An electronic system, comprising:

a processor; and

a circuit module having a plurality of leads coupled to the processor, and further having a semiconductor die coupled to the plurality of leads, wherein the semiconductor die comprises:

an integrated circuit supported by a substrate;

a metal pattern line coupled to the integrated circuit;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby

forming an exposed portion of the metal contact pad;

depositing solder on the exposed portion of the metal contact pad using selective deposition, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

57. The electronic system of claim 56, wherein the solder ball contact is formed by a method, the method further comprising depositing solder on the exposed portion of the metal contact pad using a deposition process selected from the group consisting of immersion contact, chemical vapor deposition and electrolytic deposition.

58. The electronic system of claim 56, wherein the solder comprises at least one material selected from the group consisting of lead, tin and bismuth.

59. An electronic system, comprising:

a processor; and

a circuit module having a plurality of leads coupled to the processor, and further having a semiconductor die coupled to the plurality of leads, wherein the semiconductor die comprises:

an integrated circuit supported by a substrate;

a metal pattern line coupled to the integrated circuit;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;

immersing the substrate in molten solder;

depositing solder on the exposed portion of the metal contact pad, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

60. The electronic system of claim 59, wherein the molten solder comprises at least one material selected from the group consisting of lead, tin and bismuth.

61. An electronic system, comprising:

a processor; and

a circuit module having a plurality of leads coupled to the processor, and further having a semiconductor die coupled to the plurality of leads, wherein the semiconductor die comprises:

an integrated circuit supported by a substrate;

a metal pattern line coupled to the integrated circuit;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby

forming an exposed portion of the metal contact pad;

adsorbing reactants on the exposed portion of the metal contact pad;

reacting the reactants on the exposed portion of the metal contact pad, thereby forming a solder contact; and

annealing the solder contact to form a solder ball contact.

62. An electronic system, comprising:

a processor; and

a circuit module having a plurality of leads coupled to the processor, and further having a semiconductor die coupled to the plurality of leads, wherein the semiconductor die comprises:

an integrated circuit supported by a substrate;

a metal pattern line coupled to the integrated circuit;

a metal contact pad coupled to the metal pattern line; and

a solder ball contact coupled to the metal contact pad, wherein the solder ball contact is formed by a method comprising:

forming an insulating layer on the metal contact pad;

forming a resist layer on the insulating layer;

patterning the resist layer to define a future exposed portion of the metal contact pad;

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming the exposed portion of the metal contact pad;

electrolytically depositing solder on the exposed portion of the metal contact pad, thereby forming a solder contact;

removing the resist layer, thereby exposing the solder contact above a surface of the insulating layer; and

annealing the solder contact to form a solder ball contact.

63. The electronic system of claim 62, wherein the solder comprises at least one material selected from the group consisting of lead, tin and bismuth.